

WHAT IS CLAIMED IS:

- 1 1. An apparatus for circulating a blowby gas to engine
2 cylinders in an internal combustion engine, the engine
3 cylinders having intake ports, respectively, the apparatus
4 comprising:
5 a cylinder head cover including a first wall defining a
6 first passage, and a first flange outwardly extending from
7 the first wall; and
8 a cylinder head including a second wall and a second
9 flange cooperating with the first flange to form an abutting
10 surface therebetween on which a second passage is arranged,
11 the second passage being connected with the first passage
12 and extending in a direction of a row of the engine
13 cylinders, the second wall defining a plurality of third
14 passages each having one end that is open to the second
15 flange and communicated with the second passage and an
16 opposite end open to the intake port of each of the engine
17 cylinders.
- 1 2. The apparatus as claimed in claim 1, wherein the second
2 passage is defined by the second flange of the cylinder head
3 and a groove formed in the first flange of the cylinder head
4 cover.
- 1 3. The apparatus as claimed in claim 2, further comprising
2 a seal interposed between the cylinder head cover and the
3 cylinder head, the seal comprising a portion surrounding an
4 entire periphery of the second passage.
- 1 4. The apparatus as claimed in claim 2, further comprising
2 a partition wall arranged at a bottom of the groove so as to
3 regulate a flow amount of the blowby gas passing through the
4 second passage.

1 5. The apparatus as claimed in claim 4, wherein the
2 partition wall is formed integrally with the first flange of
3 the cylinder head cover.

1 6. The apparatus as claimed in claim 1, wherein the first
2 passage comprises a blowby gas main passage extending in the
3 direction of the row of the engine cylinders and a
4 communication passage communicating the blowby gas main
5 passage with the second passage, the blowby gas main passage
6 being defined by the first wall and a plate disposed inside
7 the cylinder head cover, the communication passage being
8 formed in the first wall of the cylinder head cover.

1 7. The apparatus as claimed in claim 6, wherein the
2 communication passage comprises a lateral communication
3 passage connected with the blowby gas main passage and
4 extending in a direction parallel to the abutting surface
5 and in a direction perpendicular to the direction of the row
6 of the engine cylinders, and a vertical communication
7 passage extending in a direction perpendicular to the
8 abutting surface and connecting the lateral communication
9 passage with the second passage.

1 8. The apparatus as claimed in claim 6, wherein the second
2 passage comprises a plurality of second passages for
3 distributing the blowby gas to a pair of the engine
4 cylinders via the plurality of third passages, each of the
5 plurality of second passages being communicated with a
6 common blowby gas main passage via the communication passage.

1 9. The apparatus as claimed in claim 6, wherein the first
2 wall of the cylinder head cover comprises a first expansion

3 outwardly expanding from a portion of the first wall, the
4 second wall of the cylinder head comprising a second
5 expansion disposed corresponding to the first expansion and
6 outwardly expanding from a portion of the second wall, the
7 second passage being disposed between the first and second
8 expansions, the communication passage extending through the
9 first expansion.

1 10. The apparatus as claimed in claim 9, wherein the first
2 expansion comprises a boss portion formed integrally
3 therewith, the first and second expansions being coupled
4 with each other using a fastening member disposed at the
5 boss portion.

1 11. The apparatus as claimed in claim 10, wherein the
2 internal combustion engine comprises a fuel tube disposed on
3 the second wall of the cylinder head, and a protection cover
4 having a generally U-shaped section so as to cover the fuel
5 tube, the protection cover comprising one end portion
6 supported on the boss portion by the fastening member.

1 12. The apparatus as claimed in claim 1, wherein the
2 internal combustion engine comprises a partition wall
3 dividing an intake path inside the intake port into two
4 intake passages, each of the plurality of the third passages
5 having one end open into one of the two intake passages.

1 13. The apparatus as claimed in claim 12, wherein the one
2 end of each of the plurality of the third passages is open
3 into the one of the two intake passages downstream of the
4 partition wall.

1 14. The apparatus as claimed in claim 1, further comprising
2 a blowby gas control valve operative to adjust a flow amount
3 of the blowby gas flowing into the first passage, the blowby
4 gas control valve being mounted to the cylinder head cover.

1 15. An apparatus for circulating a blowby gas within a
2 valve chamber to engine cylinders in an internal combustion
3 engine, the valve chamber being defined by a cylinder head
4 and a cylinder head cover between which an abutting surface
5 is disposed, the engine cylinders having intake ports,
6 respectively, the apparatus comprising:
7 first wall means for defining a first passage for
8 delivering the blowby gas discharged from the valve chamber
9 in a direction parallel to the abutting surface, the first
10 passage extending in the cylinder head cover;
11 second wall means for defining a second passage for
12 allowing the blowby gas passing through the first passage to
13 flow along the abutting surface, the second passage
14 extending on the abutting surface; and
15 third wall means for defining a plurality of third
16 passages for delivering the blowby gas passing through the
17 second passage into the intake ports of the engine cylinders,
18 the plurality of third passages extending in the cylinder
19 head.

1 16. The apparatus as claimed in claim 15, further
2 comprising seal means for sealing the second passage.

1 17. The apparatus as claimed in claim 15, further
2 comprising partition means for regulating a flow amount of
3 the blowby gas passing through the second passage.

1 18. The apparatus as claimed in claim 15, wherein the first
2 passage comprises a blowby gas main passage extending in the
3 direction of a row of the engine cylinders and a
4 communication passage communicating the blowby gas main
5 passage with the second passage.

1 19. The apparatus as claimed in claim 18, wherein the
2 communication passage comprises a lateral communication
3 passage connected with the blowby gas main passage and
4 extending in a direction parallel to the abutting surface
5 and in a direction perpendicular to the direction of the row
6 of the engine cylinders, and a vertical communication
7 passage extending in a direction perpendicular to the
8 abutting surface and connecting the lateral communication
9 passage with the second passage.

1 20. The apparatus as claimed in claim 15, wherein the
2 second passage comprises a plurality of second passages
3 extending in a direction of a row of the engine cylinders
4 and splitting a flow of the blowby gas passing through the
5 first passage into branch flows of the blowby gas.

1 21. The apparatus as claimed in claim 15, wherein the
2 internal combustion engine comprises partition means for
3 dividing an intake path inside the intake port into two
4 intake passages, each of the plurality of third passages
5 having one end open into one of the two intake passages.

1 22. The apparatus as claimed in claim 21, wherein the one
2 end of each of the plurality of third passages is open into
3 the one of the two intake passages downstream of the
4 partition wall.

- 1 23. The apparatus as claimed in claim 1, further comprising
- 2 valve means for adjusting a flow amount of the blowby gas
- 3 flowing from the valve chamber into the first passage.